

REMARKS

Claims 1-13 are all the claims pending in the application. Claims 11-13 have been added to further describe the subject matter that the Applicant regards as the invention, as discussed in further detail below. Per the Examiner's request, the Applicant has also corrected several minor typographical or clerical errors in the specification by way of the above amendments. It is believed and intended that no new matter is added by this amendment.

The drawings filed on July 20, 2001 are objected to by the Examiner and by the Draftsperson. FIGS. 3-9 are objected to. However, only FIGS. 1A, 1B, 1C and 2 are present in the application. The Applicant draws the Examiner's attention to the Decision Granting Petition mailed from the USPTO on October 10, 2001, which acknowledges Applicant's submission of one (1) sheet of drawings. Therefore, the Applicant respectfully requests that the Examiner clarify the objection to the drawings since there are no FIGS. 3-9 present in the application.

Claims 1-8 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-11 of copending Application No. 09/758,165, which was cited in the proprietary Information Disclosure Statement on February 13, 2001. This copending application is currently being prosecuted by the Applicant and is under non-final rejection. Since the rejection is provisional, i.e., between pending applications, the Applicant wishes to defer related comments until the 09/758,165 application issues into a patent and such rejections are no longer provisional.

Rejection under 35 U.S.C. § 112

Claims 5 and 6 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. More specifically, the Examiner stated that the negative language in these claims is not clear. Claims 5 and 6 have been amended to more distinctly claim the subject matter which the Applicant regards as the invention and the Examiner is respectfully requested to withdraw the rejection of Claims 5 and 6 under 35 U.S.C. § 112.

Rejections under 35 U.S.C. § 103

Claims 1 and 7-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,285,426, issued to Robert Benjamin Akins et al. (the “426” reference). Regarding Claim 1, the Examiner states that ‘426 discloses reflector, adhesive layer, groove structure, transparent cover film, and light diffusing type reflection layer elements as claimed in the present invention. Moreover, the Examiner notes that the range of angles disclosed in ‘426 overlaps the range of angles claimed in the present invention. The Applicant suspects that this particular single-reference rejection is erroneously made under 35 U.S.C. § 103(a) and would fit more properly under 35 U.S.C. § 102. However, the arguments that the Applicant would use to traverse a rejection under either Rule are substantially the same. Therefore, the rejection has been addressed herein so as to advance the present application toward allowance, but clarification is requested that this rejection is indeed intended to fall under 35 U.S.C. § 103.

The present application relates to a reflector and liquid-crystal display device. The reflector is disposed on a back side of a liquid-crystal panel having a light source on one of its

side surfaces¹. The liquid-crystal device may be provided as a lighting-external light double mode liquid-crystal display device for viewing of the display lit either by the light source or by an external light². The reflector includes a transparent film formed to have a repetitive structure of a plurality of optical path changing means constituted by a structure of grooves containing optical path changing slopes³. Light is reflected by the optical path changing slopes and made to exit the transparent film⁴.

'426 discloses a ridged reflector used for optical displays⁵. The ridged reflector is of the pent roof type, characterized by element 10 in the Figs., and includes an optically transmissive layer having a ridged surface⁶. The ridged surface includes a series of ridges having a first face intersecting a second face⁷. A reflective layer overlies the first face of each of the ridges, while the second face is light-transmissive and substantially free of the reflective layer⁸.

The Examiner asserts that '426 discloses all the features of Claim 1, and that it would have been obvious to include the claimed angle range since '426 discloses an overlapping range. However, '426 is deficient in several other respects. In particular, the structural configuration is

¹ Specification paragraph 11.

² Specification paragraph 64.

³ Specification paragraph 16.

⁴ Specification paragraph 11.

⁵ '426 col. 1, lines 6-7.

⁶ '426 col. 2, lines 18-30.

⁷ Id.

⁸ Id.

completely different than the claimed invention. '426 does not disclose an adhesive layer disposed on one surface of a transparent film and a groove structure provided on the other surface of the transparent film, as is claimed in the present application. Though the Examiner characterizes element 16 of '426 as a transparent film, 16 is instead an optical cell and the closest '426 analogue to the transparent film of the present invention is element 70, the transparent polymeric layer. The '426 adhesive layer, element 30, is provided on the same side of the '426 transparent polymeric layer as is the groove structure of '426, the ridged surface element 32.

Moreover, the ridged reflector of '426 is provided at a lower side of an LCD to displace the surface glare angle of the light from an emission angle of the display light². In the claimed invention, the reflection layer is not provided on the prismatic structure as in '426 but is separate from the prismatic structure.

Finally, the inclination angle of the claimed invention is set in a range from about 35-48 degrees. The inclination angle 56 of '426 is set at about 15 degrees¹⁰. Since the LCD of '426 uses external light as above, one skilled in the art would normally set the inclination angle in a device similar to that of '426 to less than 20 degrees to provide a desired result. More specifically, if the incident angle of the external light in the '426 device is 0 degrees and the inclination angle 56 of the prism/reflector is larger than 20 degrees, the emission angle of the emitted light--that is, the display light--is then made larger than 40 degrees, which leads to undesirable viewing characteristics. On the other hand, if the inclination angles of the claimed

² '426 col. 2, lines 45-63.

¹⁰ '426 col. 8, line 14.

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invention were to be set smaller than 20 degrees (as in '426), light would be scattered and not emitted due to the use of transmission light from the light source in the claimed invention. The claimed invention and the '426 device operate in different ranges from each other to produce optimal results.

Therefore, it would not have been obvious to modify '426 to arrive at the claimed invention, even by including the range taught by '426, and the rejection of Claim 1 under 35 U.S.C. § 103(a) should be withdrawn.

With respect to the Examiner's rejection of Claims 7-10, as each modifies and depends upon Claim 1, these are patentable at least by virtue of their dependency. In addition, pertaining to Claim 8, '426 does not disclose that the adhesive layer is light-diffusing as is claimed in the present invention, instead using the term "transparent" to refer to the adhesive layer. These two light transmission properties are quite different.

Claims 2-4 are rejected under 35 U.S.C. § 103(a) as being unpatentable over '426 and further in view of U.S. Patent Nos. 6,091,469, issued to Nobuo Naito, and 5,598,281, issued to Scott M. Zimmerman et al. With respect to the Examiner's rejection of Claims 2-4, as each modifies and depends upon Claim 1, these are patentable at least by virtue of their dependency.

Claims 5 and 6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over '426 in view of U.S. Patent No. 6,266,108, issued to Yang Ying Bao et al. With respect to the Examiner's rejection of Claims 5 and 6, as each modifies and depends upon Claim 1, these are patentable at least by virtue of their dependency.

Finally, Applicant adds claims 11-13 to further define the invention. These claims clarify the layered arrangement of the elements of the reflector included in the double mode liquid-

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crystal display device as disclosed by the present application. This structure is not taught or suggested by the cited art, and therefore, these claims are patentable.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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